

CEM 510

Construction Planning & Scheduling

INTRODUCTION

Managing Project Resources

1. PLAN and SCHEDULE
2. IMPLEMENT
3. CONTROL

PROJECT RESOURCES

- Manpower
- Machines
- Material
- Money
- Time

Resource Plans

- Each Resource must be planned for and scheduled
- The schedules have common dependency on each other
- The TIME Schedule is prepared first and it is considered the basic construction schedule based on which all other resource schedules are generated

Models Used for Planning, Scheduling, and Control

- Bar Chart (Gantt)
- Network Models:
 - Critical Path Method (CPM)
 - Arrow Diagrams
 - Precedence Diagrams
 - PERT (Program Evaluation & Review Technique)

THE BAR CHART

- Developed by Henry Gantt (WWI)
- Each activity is represented by a bar
- Bar shows start / finish times
- Progress is also shown

#	Operation	Dur. (Days)	Quantity		Week Ending											
			Amt	Unit	3/30	4/6	4/13	4/20	4/27	5/4	5/11	5/18	5/25	6/1	6/8	6/15
1	Demolition	8	Sub	-	■	■										
2	Foundations	14	18	C.Y.		■	■	■	■							
3	Underground services	6	Sub	-				■	■							
4	Rough mechanical and electrical	12	Sub	-							■	■	■	■		
5	Structural steel	5	50	Ton						■	■					
6	Exterior walls	12	4000	S.F.							■	■	■	■		
7	Roof	6	5000	S.F.							■	■		■		
8	First floor slab	4	100	C.Y.							■	■				
9	Second floor slab	6	125	C.Y.								■	■	■		
10	Finish mechanical and electrical	12	Sub	-											■	■
11	Interior partitions	10	3500	S.F.											■	■
12	Paint	8	13,000	S.F.												■

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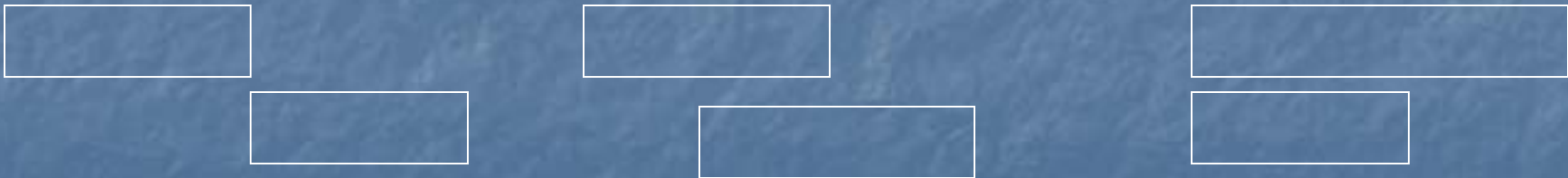
Memorial Day Holiday

Work planned 

Work complete 

ADVANTAGES OF BAR CHART

- Simple – easy to understand
- Visually effective :
 - 1) Shows total project in compact form
 - 2) Shows plan versus progress
- Can model any activity relationship



LIMITATIONS OF BAR CHART

- Does not show interdependencies between activities
- Does not show effect of change on initial plan
- Does not indicate best course of action to meet changes in conditions.

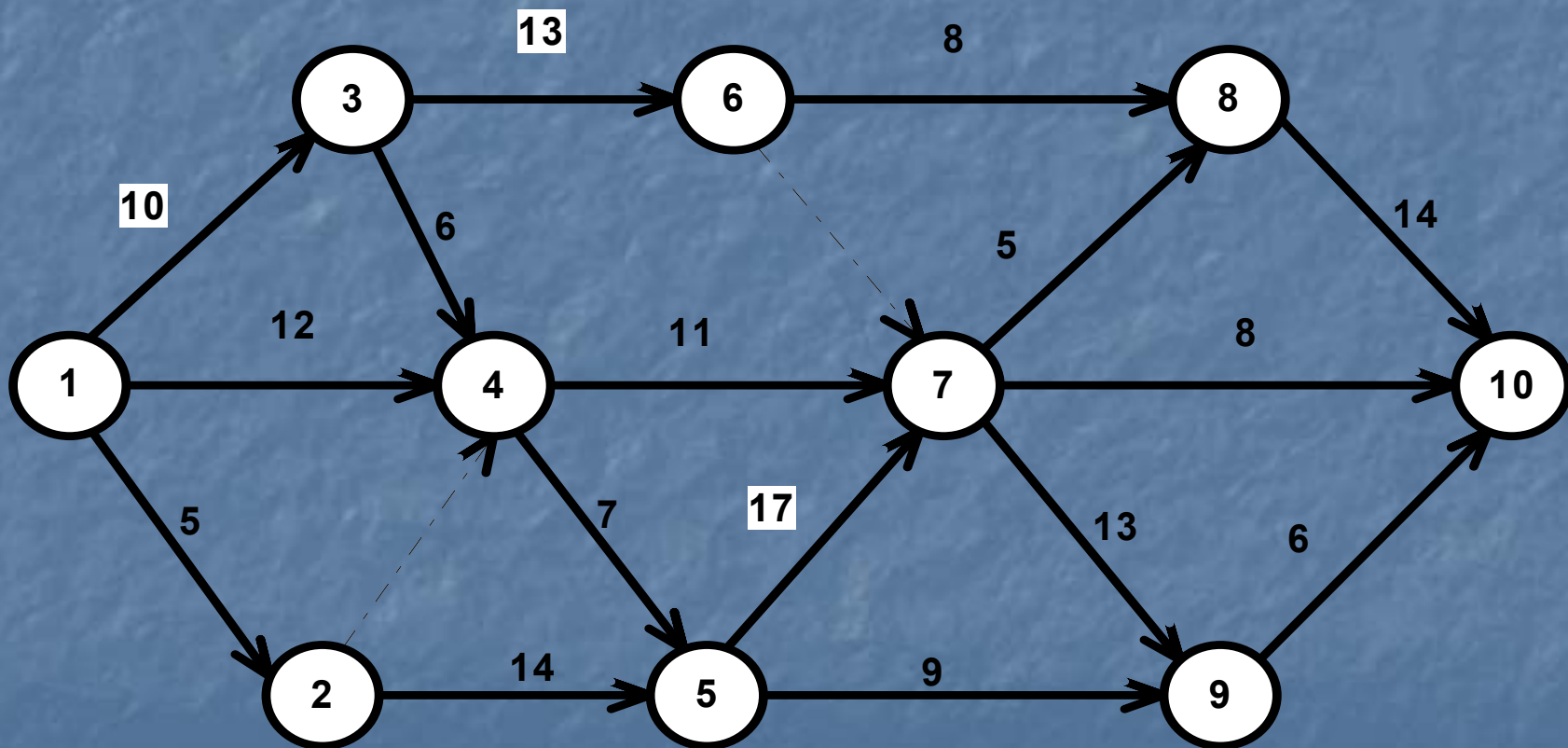
NETWORK MODELS

Network is a model consisting of nodes and links connecting the nodes.

Arrow Diagram Networks

A network with the LINKS representing the activities and NODES representing relationships between activities.

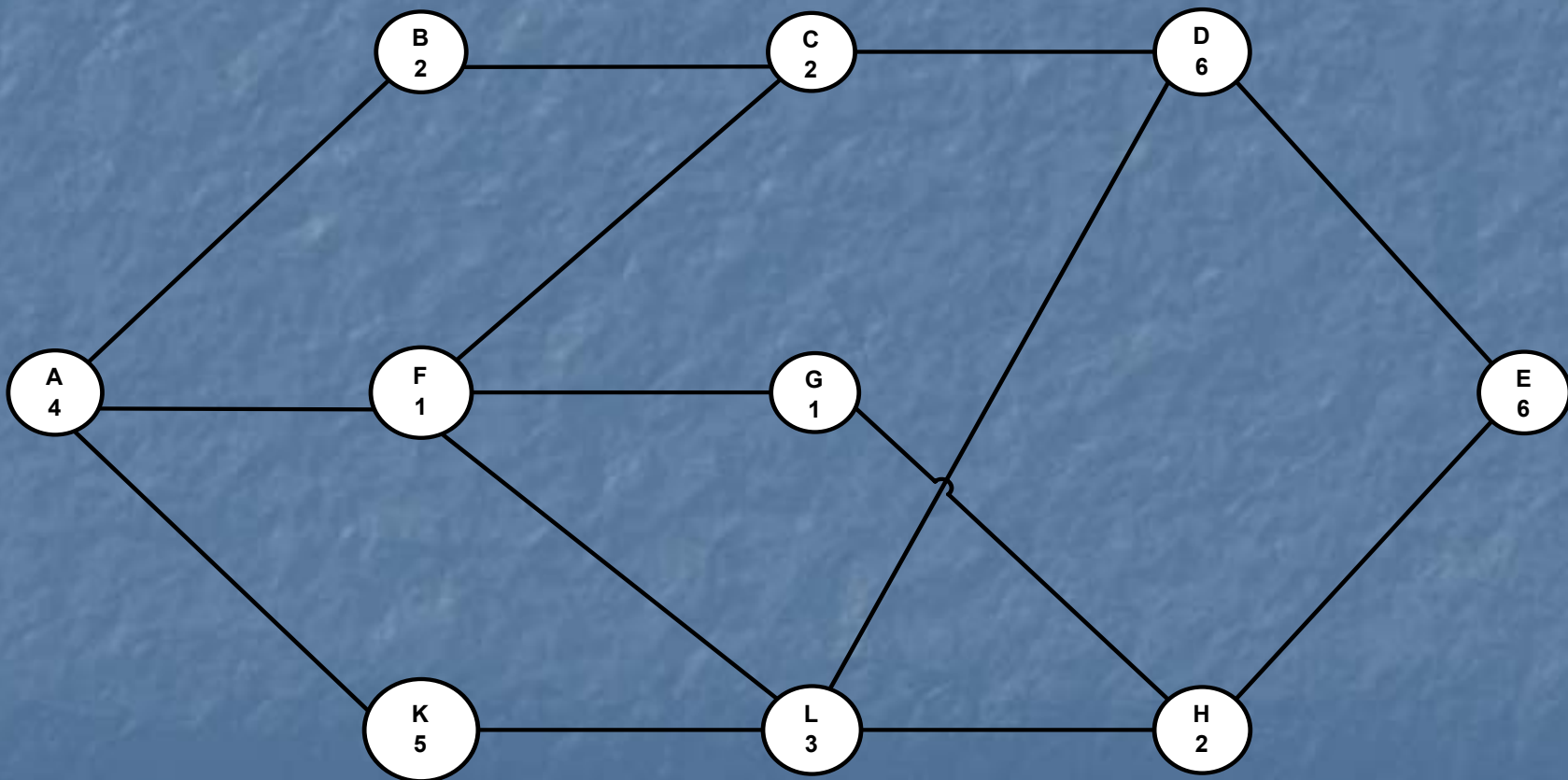
The Arrow Diagram



Precedence Networks

A network with the NODES representing the activities and the LINKS representing relationships between activities.

The Precedence Diagram



PERT

- PERT is similar to Arrow Diagrams in structure
- Unlike CPM Networks that utilize deterministic activity durations, PERT uses probabilistic activity durations

ADVANTAGES OF CPM

- Shows relationship between project activities
- Effective planning tool
- Pinpoints problem areas before they occur
- Improves communication
- Effective allocation of resources
- Evaluates effect of change

CPM BASED PROJECT MANAGEMENT

